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13. ABSTRACT

Thermodynamic data on silicon compounds from numerous sources were stored, sorted and processed by computer. Enthalpies of reactions were determined by the computer from the available data by a least squares procedure. Computer controlled automatic typesetting was used to prepare these tables of enthalpies.

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SILICON COMPOUNDS: STANDARD HEATS OF FORMATION						
THERMOCHEMICAL DATA						

Introduction

The first half of each section of the CATCH tables consists of a list of pure substances and aqueous solutions in the standard order of arrangement described in detail in ref.1. The standard enthalpies of formation and the associated uncertainties have been calculated from the standard enthalpy changes of the numbered reactions listed in the second half.

The following symbols are used to indicate the states of the substances involved.

(c) crystalline solid

(l) liquid

(g) gaseous

(am) glassy or amorphous

(a) completely dissociated species at infinite aqueous dilution

(ao) undissociated species at infinite aqueous dilution

For solutions which are not infinitely dilute, the number of moles of water associated with one mole of solute is indicated in brackets.

Elements in their standard reference states are indicated by the symbols (cs), (ls) and (gs) and these, with the hydrogen ion at infinite dilution and the gaseous electron, are defined to have zero enthalpy of formation. (N.B. the electron is omitted from the equations corresponding to the processes in which it is involved).

Since compounds are identified by the computer by their molecular weights, isomers have been distinguished by an appropriate number after the symbol defining the state of the substance.

Some of the compounds at the end of the section do not belong to that set of compounds being explicitly considered, but they are present in the reactions. The standard enthalpies of formation of these species have been derived from other sections of the CATCH tables where this is possible, or from references 1, 2 or 3 in that order of preference. Data on organic species have been obtained from reference 4. The uncertainties are assigned as zero unless they are derived from other CATCH tables in which case they are the computer processed values.

In the reactions section, the reaction number is that referred to in the compounds section as contributing to the standard enthalpy of formation of a specific compound. The reactions form an overdetermined set of equations for the calculation of standard enthalpies of formation, so the data was analysed by standard least squares procedure using the reciprocal of the uncertainty on the enthalpy of reaction as a weight. The residuals associated with the reactions are the differences between the experimental value of the standard enthalpy of reaction and that calculated from the derived standard enthalpies of formation of the species in the reaction. These residuals are printed only when greater than 0.001kcal/mol and are a measure of the compatibility of a specific reaction with the others. The uncertainties (errors) on the standard enthalpies of formation were calculated from the uncertainties (errors) on the standard enthalpies of reaction by standard stastistical methods (see, for example, ref.4, p.43).

Any species already considered by the CODATA task group (ref.1) are assumed to have well defined standard enthalpies of formation and no attempt has been made to reanalyse the data leading to those values. The formation reaction of the species from the elements are included (labelled COD), and the weight of that equation in the least squares process has been increased to such an extent that the residual is always less than 0.001kcal/mol.

To make the list of compounds as comprehensive as possible, values of the enthalpy of the (often) hypothetical formation reaction of some compounds from their elements have been taken from reference 2 (and labelled NBS). Because the data sources leading to the selection of NBS values are at present unlisted, no further attempts at critical assessment have been made, and the uncertainty interval is assumed to be ten times the last figure given in reference 2. However, wherever

enthalpies of formation can be derived from critically assessed data without resort to unassessed values, this procedure has been adopted and the NBS data disregarded. It is intended that the number of references to NBS will be gradually reduced as critical assessment becomes possible. NBS data has also been used to provide enthalpies of solution and dilution.

Also included in the list of reactions are equations defining the equivalence of the enthalpies of a completely ionised solute at infinite dilution and the ions which are assumed to constitute the molecule of the electrolyte.

The uncertainties on many of the experimental standard enthalpies of reaction have been increased compared with the values quoted in the literature, when it was felt by the selector that large systematic errors may possibly be present. This is a very subjective operation and suggestions concerning the reliability of the data in the tables would be welcomed by the selector.

References

1 (COD) Report of CODATA Task Group on Key Values for Thermodynamics, Nov. 1971. CODATA BULLETIN No. 6, 1971.

2 (NBS) Wagman, Evans, Parker, Harlow, Bailey, and Schumm, *Selected Values of Chemical Thermodynamic Properties, Natl. Bur. Stand. Tech.* Note 270-3 U.S. Government Printing Office, Washington D.C., 1968.

3 Rossini, Wagman, Evans, Levine and Jaffe, *Selected Values of Chemical Thermodynamic Properties, Natl. Bur. Stand. Circ.* 500.

4 Cox and Pilcher, *Thermochemistry of Organic and Organometallic Compounds,* Academic Press, London, 1970.

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Silicon compounds

Compound	Formula weight	ΔHf° (kcal/mol)	Error	ΔHf° (kj/mol)	Reactions for ΔHf°	
Si(cs)	28.086	0.000	0.000	0.000	0	
Si(am)	28.086	1.000	0.101	4.184	2	20
					23	
Si(l)	28.086	11.586	0.101	48.475	1	115
					128	130
Si(g)	28.086	107.920	0.863	451.536	3	36
					37	39
					40	41
					123	125
					127	129
					216	
$Si^+(g)$	28.086	297.370	0.869	1244.195	4	
$Si_2(g)$	56.172	141.840	3.754	593.457	5	
$Si_3(g)$	84.258	152.759	10.330	639.145	6	
SiO(g)	44.085	−24.775	1.590	−103.658	7	8
					9	10
$SiO^+(g)$	44.085	224.225	10.126	938.158	11	
SiO_2(c1)	60.085	−217.997	0.271	−912.101	7	8
Alpha, quartz						
					12	13
					14	47
SiO_2(c2)	60.085	−217.494	0.339	−909.995	10	13
Alpha, tridymite						
SiO_2(c3)	60.085	−217.397	0.289	−909.590	14	44
Alpha, cristobalite						
SiO_2(am)	60.085	−215.744	0.269	−902.674	9	12
					17	45
					46	
SiO_2(l)	60.085	−216.047	0.406	−903.942	15	
SiO_2(g)	60.085	−74.397	10.004	−311.278	16	
SiO_2(a)	60.085	−217.244	0.288	−908.950	17	81
Colloidal solution						
					82	192
					193	194
$SiO_2^+(g)$	60.085	195.603	14.145	818.402	18	
SiH(g)	29.094	90.023	3.443	376.655	19	
$SiH_2^+(g)$	30.102	285.291	7.073	1193.658	21	25
$SiH_3(g)$	31.110	54.250	11.191	226.984	26	
$SiH_3^+(g)$	31.110	234.749	5.010	982.189	22	
$SiH_4(g)$	32.118	8.302	0.319	34.735	20	21
					25	
$Si_2H_5^+(g)$	61.212	229.896	10.007	961.885	27	
Si_2H_6(l)	62.220	14.499	0.619	60.664	24	
$Si_2H_6(g)$	62.220	19.099	0.364	79.911	23	25
Si_3H_8(l)	92.322	22.200	1.158	92.885	29	
$Si_3H_8(g)$	92.322	28.900	1.045	120.918	28	
H_2SiO_3(c)	78.100	−284.100	1.000	−1188.674	30	
H_2SiO_3(ao)	78.100	−282.700	1.005	−1182.817	31	
H_4SiO_4(c)	96.116	−354.000	1.000	−1481.136	32	
H_4SiO_4(ao)	96.116	−351.000	1.005	−1468.584	33	
$H_2Si_2O_5$(c)	138.185	−499.200	1.000	−2088.653	34	
$H_6Si_2O_7$(c)	174.216	−638.000	1.000	−2669.392	35	
SiF(g)	47.084	−4.508	1.889	−18.861	36	37
$SiF^+(g)$	47.084	163.892	5.345	685.725	55	

Compound	Formula weight	ΔHf° (kcal/mol)	Error	ΔHf° (kj/mol)	Reactions for ΔHf°
SiF_2(c)	66.083	−186.289	2.009	−779.431	38
Polymer					
SiF_2(g)	66.083	−140.786	1.122	−589.048	37 39
					40 41
					56
SiF_2^+(g)	66.083	120.172	8.199	502.801	56 60
SiF_3(g)	85.081	−227.269	14.143	−950.892	57
SiF_3^+(g)	85.081	−31.269	10.002	−130.828	58
SiF_3^-(g)	85.081	−304.269	14.284	−1273.060	42
SiF_4(g)	104.080	−385.989	0.191	−1614.976	43 44
					45 46
					47 48
					60 122
					124
SiF_4^+(g)	104.080	−23.689	10.002	−99.113	59
SiF_6^{--}(a)	142.076	−571.000	1.000	−2389.064	49
$Si_2F_4^+$(g)	132.166	−105.997	18.278	−443.493	64
Si_2F_5(g)	151.164	−366.617	20.834	−1533.927	63
$Si_2F_5^+$(g)	151.164	−203.558	12.916	−851.687	61
Si_2F_6(c)	170.162	−575.958	8.189	−2409.809	51
Si_2F_6(l)	170.162	−572.058	8.231	−2393.491	53
Si_2F_6(g)	170.162	−565.558	8.174	−2366.295	50 60
$Si_3F_7^+$(g)	217.247	−414.266	18.277	−1733.288	65
Si_3F_8(c)	236.245	−769.686	15.307	−3220.366	52
Si_3F_8(l)	236.245	−764.386	15.329	−3198.190	54
Si_3F_8(g)	236.245	−755.586	15.298	−3161.371	62
$Si_3F_8^+$(g)	236.245	−505.586	18.277	−2115.371	66
SiH_3F(g)	50.108	−105.000	5.000	−439.320	72
H_2SiF_2(g)	68.099	−194.000	10.000	−811.696	73
$SiHF_3$(g)	86.089	−283.000	5.000	−1184.072	74
$H_2SiF_6(20H_2O)$	144.092	−575.530	0.512	−2408.016	67
H_2SiF(a1)	144.092	−575.373	0.473	−2407.362	68 71
In 1.444 HF. 211.729H_2O					
					183
H_2SiF(a2)	144.092	−574.670	0.471	−2404.420	69 70
In 41.157 HF. 174.657H_2O					
					184
H_2SiF_6(a3)	144.092	−574.670	0.471	−2404.420	70 83
In 179 HF. 758H_2O					
H_2SiF_6(a4)	144.092	−575.373	0.473	−2407.362	71 131
H_2SiF_6, 1.5HF. 600H_2O					
					135 136
					137 182
SiCl(g)	63.539	46.909	10.037	196.266	75
$SiCl_2$(g)	98.992	−39.913	0.175	−166.998	84
$SiCl_3^+$(g)	134.445	103.899	7.073	434.713	85 86
$SiCl_4$(c)	169.898	−167.322	0.162	−700.076	76
$SiCl_4$(l)	169.898	−165.477	0.161	−692.356	77 78
					79 80
					81 82
					83
$SiCl_4$(g)	169.898	−158.387	0.190	−662.690	77 85
SiH_3Cl(g)	66.563	−48.000	5.000	−200.832	87
SiH_2Cl_2(g)	101.008	−80.000	10.000	−334.720	88
$SiCl_3H$(l)	135.453	−121.723	0.319	−509.290	90
$SiCl_3H$(g)	135.453	−115.223	0.303	−482.094	86 89
$ClSiF_3$(g)	120.534	−315.000	5.000	−1317.960	91
$FSiCl_3$(g)	153.443	−201.000	5.000	−840.984	92
SiBr(g)	107.990	50.000	1.000	209.200	93
$SiBr_2$(g)	187.894	−11.142	0.792	−46.618	97
$SiBr_4$(l)	347.702	−105.844	1.280	−442.851	95 96
$SiBr_4$(g)	347.702	−95.464	1.297	−399.421	94
$SiHBr_3$(l)	268.806	−76.170	2.000	−318.695	99

Compound	Formula weight	$\Delta Hf°$ (kcal/mol)	Error	$\Delta Hf°$ (kj/mol)	Reactions for $\Delta Hf°$
$SiHBr_3(g)$	268.806	−67.170	2.236	−281.039	98
$SiI_2(g)$	281.895	19.346	2.462	80.944	103
$SiI_4(c)$	535.704	−48.320	2.197	−202.171	100
$SiI_4(l)$	535.704	−45.320	0.909	−189.619	102
$SiI_4(g)$	535.704	−28.420	2.197	−118.909	101
$SiS(g)$	60.146	16.926	0.101	70.818	104
$SiS_2(c)$	92.206	−51.604	2.552	−215.912	106
$SiS_2(l)$	92.206	−46.604	2.741	−194.992	105
$SiSe(g)$	107.046	23.780	0.101	99.496	107
$SiSe_2(c)$	186.006	−7.000	1.000	−29.288	108
$SiTe(g)$	155.686	51.710	1.000	216.355	109
$SiTe_2(g)$	283.286	53.300	5.000	223.007	110
$Si_2Te_3(c)$	438.972	−19.750	5.000	−82.634	111
$SiN(g)$	42.093	90.890	10.037	380.283	112
$Si_2N(g)$	70.179	92.340	1.995	386.349	113
$Si_3N_4(c)$	140.285	−177.606	0.995	−743.105	114 115
Alpha					
$(NH_4)_2SiF_6(c1)$	178.154	−640.940	0.101	−2681.693	116
Hexagonal					
$(NH_4)_2SiF_6(c2)$	178.154	−640.670	0.143	−2680.563	117
Cubic					
$(NH_4)_2SiF_6(a)$	178.154	−634.700	1.000	−2655.585	118
$(NH_4)_2SiF_6(550H_2O)$	178.154	−634.005	1.000	−2652.677	119
$(NH_4)_2SiF_6(800H_2O)$	178.154	−633.865	1.000	−2652.091	120
$(NH_4)_2SiF_6(1500H_2O)$	178.154	−633.600	1.000	−2650.982	121
$SiC(c1)$	40.097	−17.270	0.422	−72.258	122 123
Beta, cubic					
$SiC(c2)$	40.097	−17.505	0.392	−73.240	124 125
Alpha, hexagonal					
$SiC(g)$	40.097	172.225	3.443	720.588	126
$SiC_2(g)$	52.108	147.217	2.854	615.957	127 128
$Si_2C(g)$	68.183	128.524	3.028	537.746	129 130
$CH_3SiH_2^+(g)$	45.137	212.223	17.399	887.941	162
$CH_3SiH_3(l)$	46.145	−12.164	20.068	−50.894	142
$CH_3SiH_3(g)$	46.145	−7.774	20.068	−32.526	160
$(CH_3)_2SiH(g)$	59.164	5.870	1.724	24.560	158
$(CH_3)_2SiH^+(g)$	59.164	184.320	10.135	771.195	164
$(CH_3)_2SiH_2(l)$	60.172	−25.077	14.238	−104.922	143
$(CH_3)_2SiH_2(g)$	60.172	−19.977	14.238	−83.584	161
					128 130
					215
$(CH_3)_3Si(g)$	73.191	−9.321	1.581	−39.001	157 159
					167 170
					174
$(CH_3)_3Si^+(g)$	73.191	154.379	3.081	645.922	163 165
					167 169
$(CH_3)_3SiH(l)$	74.199	−43.250	1.653	−180.958	144
$(CH_3)_3SiH(g)$	74.199	−37.430	1.650	−156.607	157 163
$(CH_3)_4Si(l1)$	88.226	−62.733	2.078	−262.476	131 145
$(CH_3)_4Si(g1)$	88.226	−56.481	2.079	−236.314	145 165
					202
$(C_2H_5)_2SiH_2(l2)$	88.226	−50.322	3.367	−210.547	132
$(C_2H_5)_2SiH_2(g2)$	88.226	−43.142	3.368	−180.505	146
$(CH_3)_2Si(CH_2)_3(l)$	100.237	−40.873	3.367	−171.012	139
$(CH_3)_2Si(CH_2)_3(g)$	100.237	−32.573	3.404	−136.285	154
1:1-Dimethyl silacyclobutane					
$(CH_3)_3SiC_2H_5(l)$	102.253	−66.321	10.466	−277.487	147
$(CH_3)_3SiC_2H_5(g)$	102.253	−59.121	10.464	−247.362	166
$(CH_3)_2Si(CH_2)_4(l)$	114.264	−51.939	1.732	−217.312	140
$(CH_3)_2Si(CH_2)_4(g)$	114.264	−42.939	1.803	−179.656	155
1:1-Dimethyl silacyclopentane					
$(C_2H_5)_3SiH(l1)$	116.280	−56.254	5.022	−235.366	133
$(C_2H_5)_3SiH(g1)$	116.280	−47.554	5.031	−198.965	148

Compound	Formula weight	$\Delta Hf°$ (kcal/mol)	Error	$\Delta Hf°$ (kj/mol)	Reactions for $\Delta Hf°$
$(C_2H_5)_4Si(l)$	144.334	−72.586	5.022	−303.699	134
$(C_2H_5)_4Si(g)$	144.334	−63.086	5.047	−263.951	149
$(CH_3)_5Si_2(g)$	131.347	−22.534	8.474	−94.283	169 173
$(CH_3)_5Si_2^+(g)$	131.347	120.743	6.619	505.188	168 170 173
$Si_2C_6H_{16}(l)$	144.366	−80.882	3.465	−338.409	141
$Si_2C_6H_{16}(g)$	144.366	−71.082	3.501	−297.406	156
1:1,3:3,-Tetramethyl, 1,3,-Disilacyclobutane					
$(CH_3)_6Si_2(l)$	146.382	−94.770	2.554	−396.520	135 150
$(CH_3)_6Si_2(g)$	146.382	−85.830	2.556	−359.115	150 159 167 168
$(CH_3)_7Si_3(g)$	189.503	−28.608	11.600	−119.698	172
$(CH_3)_7Si_3^+(g)$	189.503	94.312	8.007	394.603	171 174
$(CH_3)_8Si_3(l)$	204.538	−123.564	4.455	−516.992	136 151
$(CH_3)_8Si_3(g)$	204.538	−112.567	4.457	−470.980	151 169 170 171
$(CH_3)_9Si_4(g)$	247.659	−23.500	15.494	−98.325	175
tris-Trimethylsilyl silyl radical					
$(CH_3)_{10}Si_4(l)$	262.694	−146.132	4.994	−611.415	137 152
$(CH_3)_{10}Si_4(g)$	262.694	−133.629	5.006	−559.106	152 173 174
n-Decamethyl tetrasilane					
$(CH_3)_{12}Si_5(c)$	320.850	−151.321	10.275	−633.128	138
$(CH_3)_{12}Si_5(g)$	320.850	−131.321	11.427	−549.448	153
Tetrakis-trimethylsilyl silane					
$CH_3Si(OH)_3(a)$	94.143	−275.355	4.904	−1152.085	176
$(CH_3)_2Si(OH)_2(a)$	92.171	−206.238	2.428	−862.900	177 197
$(CH_3)_3SiOH(l)$	90.198	−130.206	0.746	−544.780	178
$(CH_3)_3SiOH(g)$	90.198	−119.306	0.855	−499.175	179
$(CH_3)_3SiOC_2H_5(l)$	118.252	−126.131	0.746	−527.730	180
$(C_6H_5)_2Si(OH)_2(a)$	216.313	−155.000	5.000	−648.520	181
$(CH_3)_6Si_2O(l)$	162.381	−194.496	1.478	−813.772	182 183
$(CH_3)_6Si_2O(l)$	162.381	−194.496	1.478	−813.772	182 183 184 204 205 219 220
$(CH_3)_6Si_2O(g)$	162.381	−185.596	1.536	−776.534	188
Hexamethyl disiloxane					
$(CH_3)_8Si_3O_2(l)$	236.537	−338.072	3.622	−1414.491	185
$(CH_3)_8Si_3O_2(g)$	236.537	−328.572	3.657	−1374.743	189
Octamethyl trisiloxane					
$(CH_3)_{10}Si_4O_3(l)$	310.692	−471.946	10.177	−1974.624	186
$(CH_3)_{10}Si_4O_3(g)$	310.692	−460.446	10.189	−1926.508	190
Decamethyl tetrasiloxane					
$(CH_3)_{12}Si_5O_4(l)$	384.848	−624.021	5.530	−2610.905	187
$(CH_3)_{12}Si_5O_4(g)$	384.848	−611.321	5.553	−2557.768	191
Dodecamethylpentasiloxane					
$CH_3SiCl_3(l)$	149.480	−138.709	4.876	−580.358	193 201
$CH_3SiCl_3(g)$	149.480	−131.206	4.874	−548.964	201 203
$CH_3HSiCl_2(l)$	115.035	−105.618	5.008	−441.907	196
$(CH_3)_2SiCl^+(g)$	93.609	126.656	10.029	529.928	207
$(CH_3)_2HSiCl(l)$	94.617	−79.595	5.008	−333.026	195
$(CH_3)_2SiCl_2(l)$	129.062	−117.049	2.425	−489.734	194 197 200
$(CH_3)_2SiCl_2(g)$	129.062	−109.511	2.421	−458.193	200 202 203
$(CH_3)_3SiCl(l)$	108.644	−91.747	0.741	−383.870	192 199 204 205
$(CH_3)_3SiCl(g)$	108.644	−84.544	0.764	−353.733	199 202 203
$(C_6H_5)_2SiCl_2(l)$	253.204	−66.316	5.028	−277.466	198
$(CH_3)_2SiBr^+(g)$	138.060	143.301	10.030	599.573	210
$(CH_3)_3SiBr(l)$	153.095	−78.099	0.746	−326.764	208

Compound	Formula weight	ΔH*f*° (kcal/mol)	Error	ΔH*f*° (kj/mol)	Reactions for ΔH*f*°
$(CH_3)_3SiBr(g)$	153.095	−70.299	0.774	−294.129	209
$(CH_3)_2SiI^+(g)$	185.060	154.846	14.474	647.876	212
$(CH_3)_3SiI(g)$	200.095	−49.454	10.464	−206.916	211
$(CH_3)_3SiSC_4H_9(l)$ N-butylthio-trimethylsilane	162.367	−91.011	0.746	−380.788	213
$(CH_3)_3SiSC_4H_9(g)$	162.367	−81.311	0.753	−340.203	214
SiCN(g)	54.104	90.582	2.344	378.994	215 216
$(CH_3)_3SiNHCH_3(l)$	103.241	−63.939	0.746	−267.519	217
$(CH_3)_3SiNHCH_3(g)$	103.241	−55.339	0.753	−231.537	223
$(CH_3)_3SiN(CH_3)_2(l)$	117.268	−66.856	0.746	−279.724	218
$(CH_3)_3SiN(CH_3)_2(g)$	117.268	−59.256	0.753	−247.925	224
$(CH_3)_3SiN(C_2H_5)_2(l)$	145.322	−87.647	0.800	−366.715	206
$(CH_3)_6Si_2NH(l)$	161.397	−123.573	1.479	−517.029	219 220
$(CH_3)_6Si_2NH(g)$	161.397	−113.673	1.482	−475.608	225
$(CH_3)_6Si_2NCH_3(l)$	175.424	−117.429	1.492	−491.324	221
$(CH_3)_6Si_2NCH_3(g)$	175.424	−108.129	1.496	−452.412	226
$(CH_3)_9Si_3N(c)$	233.580	−172.317	2.286	−720.973	222
$(CH_3)_9Si_3N(g)$	233.580	−159.317	2.288	−666.581	227

Compounds from other sections

Compound	Formula weight	ΔH*f*° (kcal/mol)	Error	ΔH*f*° (kj/mol)
$O_2(gs)$	31.999	0.000	0.000	0.000
H(g)	1.008	52.103	0.000	217.999
$H_2(gs)$	2.016	0.000	0.000	0.000
$H_2O(l)$	18.015	−68.315	0.000	−285.830
$H_2O(g)$	18.015	−57.795	0.000	−241.814
F(g)	18.998	18.880	1.000	78.994
$F^-(g)$	18.998	−64.700	0.500	−270.705
$F_2(gs)$	37.997	0.000	0.000	0.000
HF(g)	20.006	−65.320	0.072	−273.297
$HF(4.0H_2O)$	20.006	−76.831	0.070	−321.461
$HF(25H_2O)$	20.006	−77.015	0.070	−322.230
$HF(30H_2O)$	20.006	−77.021	0.070	−322.256
$HF(80H_2O)$	20.006	−77.046	0.070	−322.360
Cl(g)	35.453	28.989	0.001	121.290
$Cl_2(gs)$	70.906	0.000	0.000	0.000
HCl(a)	36.461	−39.933	0.001	−167.080
$HCl(10H_2O)$	36.461	−38.537	0.001	−161.239
$HCl(50H_2O)$	36.461	−39.502	0.001	−165.276
$HCl(100H_2O)$	36.461	−39.638	0.001	−165.845
$HCl(500H_2O)$	36.461	−39.793	0.001	−166.494
$HCl(600H_2O)$	36.461	−39.804	0.001	−166.540
$HCl(800H_2O)$	36.461	−39.820	0.001	−166.607
$HCl(1500H_2O)$	36.461	−39.848	0.001	−166.724
$Br_2(ls)$	159.808	0.000	0.000	0.000
$HBr(50H_2O)$	80.912	−28.708	0.001	−120.114
I(g)	126.905	25.517	0.003	106.763
S(cs)	32.060	0.000	0.000	0.000
$H_2S(g)$	34.076	−4.930	0.000	−20.627
Se(cs)	78.960	0.000	0.000	0.000
$Te_2(g)$	255.200	40.200	0.000	168.197
N(g)	14.007	112.970	0.003	472.666
$N_2(gs)$	28.013	0.000	0.000	0.000
$NH_4^+(a)$	18.039	−31.850	0.001	−133.260
$NH_4Cl(50H_2O)$	53.492	−71.647	0.002	−299.771
$NH_4Cl(1500H_2O)$	53.492	−71.720	0.002	−300.076

Compound	Formula weight	$\Delta Hf°$ (kcal/mol)	Error	$\Delta Hf°$ (kj/mol)
C(cs)	12.011	0.000	0.000	0.000
CO_2(g)	44.010	−94.051	0.000	−393.509
CH_3(g)	15.035	33.200	0.000	138.909
C_2H_5(g)	29.062	25.000	0.000	104.600
$C_2H_5OH(50H_2O)$	46.069	−68.740	0.000	−287.608
CF_4(g)	88.005	−223.040	0.000	−933.199
C_4H_9SH(l)	90.184	−29.720	0.000	−124.348
$(C_2H_5)_2NH$(l)	73.139	−24.780	0.000	−103.680
$CH_3NH_3Cl(50H_2O)$	67.519	−69.650	0.000	−291.416
$(CH_3)_2NH_2Cl(50H_2O)$	81.546	−68.567	0.000	−286.884
$(C_2H_5)_2NH_2Cl$(c)	109.600	−85.760	0.000	−358.820
Ga(l)	69.720	1.330	0.000	5.565
Ga_2O(g)	155.439	−21.000	0.000	−87.864
Ag(cs)	107.868	0.000	0.000	0.000
AgCl(c)	143.321	−30.370	0.000	−127.068
AgBr(c)	187.772	−23.990	0.000	−100.374
AgI(c)	234.772	−14.780	0.000	−61.840
Ca(g)	40.080	42.600	0.000	178.238
CaF(g)	59.078	−65.000	0.000	−271.960
CaF_2(c)	78.077	−291.500	0.000	−1219.636
CaF_2(g)	78.077	−186.800	0.000	−781.571
Na(cs)	22.990	0.000	0.000	0.000
NaOH(c)	39.997	−101.990	0.000	−426.726
NaF(c)	41.988	−137.910	0.000	−577.015
NaCl(c)	58.443	−98.230	0.000	−410.994
NaBr(c)	102.894	−86.030	0.000	−359.950
Na_2SiO_3(c)	122.064	−363.000	0.000	−1518.792

Reactions

	Reaction	ΔH° (kcal/mol)	Error	Ref
1	$Si(cs)=Si(l)$	11.585	0.100	71/1
2	$Si(cs)=Si(am)$	1.000	0.100	NBS
3	$Si(cs)=Si(g)$	107.700	1.000	71/1
		Residual	−0.220	
4	$Si(g)=Si^+(g)$	189.450	0.100	49/1
5	$Si_2(g)=2Si(g)$	74.000	3.000	71/1
6	$Si_3(g)=3Si(g)$	171.000	10.000	71/1
7	$SiO_2(c1)+H_2(gs)=SiO(g)+H_2O(g)$	135.200	5.000	63/2
		Residual	−0.227	
8	$Si(cs)+SiO_2(c1)=2SiO(g)$	168.800	5.000	63/2
		Residual	0.353	
9	$2Ga(l)+SiO_2(am)=SiO(g)+Ga_2O(g)$	170.800	5.000	62/1
		Residual	3.491	
10	$Si(cs)+SiO_2(c2)=2SiO(g)$	165.960	5.000	62/1
		Residual	−1.984	
11	$SiO(g)=SiO^+(g)$	249.000	12.000	55/1
12	$SiO_2(am)=SiO_2(c1)$	−2.210	0.100	12/1
		Residual	0.043	
		−2.330	0.100	21/1
		Residual	−0.077	
13	$SiO_2(c1)=SiO_2(c2)$	0.500	0.200	62/1
		Residual	−0.003	
14	$SiO_2(c1)=SiO_2(c3)$	0.600	0.100	71/1
15	$SiO_2(c1)=SiO_2(l)$	1.950	0.300	71/1
16	$SiO_2(c3)=SiO_2(g)$	143.000	8.000	71/1
17	$SiO_2(a)=SiO_2(am)$	1.500	0.100	31/1
18	$SiO_2(g)=SiO_2^+(g)$	270.000	12.000	55/1
19	$SiH(g)=Si(g)+H(g)$	70.000	3.000	71/1
20	$SiH_4(g)=Si(am)+2H_2(gs)$	−7.300	0.300	61/1
		Residual	0.002	
21	$SiH_4(g)=SiH_2^+(g)+H_2(gs)$	279.000	9.000	63/3
		Residual	2.011	
		274.400	9.000	69/3
		Residual	−2.589	
		274.700	9.000	62/2
		Residual	−2.289	
22	$SiH_4(g)=SiH_3^+(g)+H(g)$	272.100	9.000	63/3
		Residual	−6.450	
		272.400	9.000	66/2
		Residual	−6.150	
		283.700	9.000	69/3
		Residual	5.150	
		286.000	9.000	62/2
		Residual	7.450	
23	$Si_2H_6(g)=2Si(am)+3H_2(gs)$	−17.100	0.300	61/1
24	$Si_2H_6(l)=Si_2H_6(g)$	4.600	0.500	33/1
25	$Si_2H_6(g)=SiH_2^+(g)+SiH_4(g)$	275.300	9.000	62/5
		Residual	0.806	
		275.600	9.000	69/3
		Residual	1.106	
26	$Si_2H_6(g)=SiH_3^+(g)+SiH_3(g)$	273.300	9.000	62/5
		Residual	3.400	
		275.600	9.000	69/3
		Residual	5.700	
		260.800	9.000	66/2
		Residual	−9.100	
27	$Si_2H_6(g)=Si_2H_5^+(g)+H(g)$	262.900	9.000	69/3

	Reaction	ΔH°	Error	Ref
		(kcal/mol)		
28	$Si_3H_8(g)=3Si(am)+4H_2(gs)$	−25.900	1.000	64/3
29	$Si_3H_8(l)=Si_3H_8(g)$	6.700	0.500	33/1
30	$2H_2(gs)+3O_2(gs)+2Si(cs)=2H_2SiO_3(c)$	−568.200	2.000	NBS
31	$H_2SiO_3(c)=H_2SiO_3(ao)$	1.400	0.100	NBS
32	$2H_2(gs)+2O_2(gs)+Si(cs)=H_4SiO_4(c)$	−354.000	1.000	NBS
33	$H_4SiO_4(c)=H_4SiO_4(ao)$	3.000	0.100	NBS
34	$2H_2(gs)+5O_2(gs)+4Si(cs)=2H_2Si_2O_5(c)$	−998.400	2.000	NBS
35	$6H_2(gs)+7O_2(gs)+4Si(cs)=2H_6Si_2O_7(c)$	−1276.000	2.000	NBS
36	$SiF(g)=Si(g)+F(g)$	125.000	10.000	58/1
		Residual	−6.308	
37	$Si(g)+SiF_2(g)=2SiF(g)$	23.500	3.000	71/1
		Residual	−0.350	
38	$SiF_2(c)+F_2(gs)=SiF_4(g)$	−199.700	1.700	70/3
39	$CaF_2(c)+Si(g)=Ca(g)+SiF_2(g)$	86.700	1.500	64/9
		Residual	1.306	
40	$CaF_2(g)+Si(g)=Ca(g)+SiF_2(g)$	−16.700	1.500	64/9
		Residual	2.606	
41	$2CaF(g)+Si(g)=2Ca(g)+SiF_2(g)$	−34.700	0.900	64/9
		Residual	−1.194	
42	$SiF_3(g)=SiF_3^-(g)$	−77.000	2.000	70/2
43	$Si(cs)+2F_2(gs)=SiF_4(g)$	−385.980	0.190	63/2
		Residual	0.009	
44	$SiF_4(g)+2H_2O(g)=SiO_2(c3)+4HF(g)$	24.530	5.000	63/1
		Residual	1.627	
45	$SiF_4(g)+2H_2O(g)=SiO_2(am)+4HF(g)$	26.370	5.000	63/1
		Residual	1.814	
46	$SiO_2(am)+2F_2(gs)=SiF_4(g)+O_2(gs)$	−170.040	0.250	63/2
		Residual	0.204	
47	$SiO_2(c1)+2F_2(gs)=SiF_4(g)+O_2(gs)$	−168.260	0.280	63/2
		Residual	−0.269	
48	$SiF_4(g)+4Na(cs)=4NaF(c)+Si(cs)$	−174.100	10.000	60/2
		Residual	−8.449	
49	$Si(cs)+3F_2(gs)=SiF_6^{--}(a)$	−571.000	1.000	NBS
50	$2Si(cs)+3F_2(gs)=Si_2F_6(g)$	−565.000	10.000	64/6
		Residual	0.558	
51	$Si_2F_6(c)=Si_2F_6(g)$	10.400	0.500	65/1
52	$Si_3F_8(c)=Si_3F_8(g)$	14.100	0.500	65/1
53	$Si_2F_6(c)=Si_2F_6(l)$	3.900	0.800	65/1
54	$Si_3F_8(c)=Si_3F_8(l)$	5.300	0.800	65/1
55	$SiF(g)=SiF^+(g)$	168.400	5.000	68/1
56	$SiF_2(g)=SiF_2^+(g)$	260.400	6.900	68/1
		Residual	−0.558	
57	$SiF_3(g)=SiF_3^+(g)$	196.000	20.000	68/1
58	$SiF_4(g)=SiF_3^+(g)+F(g)$	373.600	6.900	68/1
59	$SiF_4(g)=SiF_4^+(g)$	362.300	6.900	68/1
60	$Si_2F_6(g)=SiF_2^+(g)+SiF_4(g)$	300.300	6.900	68/1
		Residual	0.558	
61	$Si_2F_6(g)=Si_2F_5^+(g)+F^-(g)$	297.300	6.900	68/1
62	$Si_3F_8(g)=SiF_2^+(g)+Si_2F_6(g)$	310.200	6.900	68/1
63	$Si_3F_8(g)=SiF_3^+(g)+Si_2F_5(g)$	357.700	6.900	68/1
64	$Si_3F_8(g)=Si_2F_4^+(g)+SiF_4(g)$	263.600	6.900	68/1
65	$Si_3F_8(g)=Si_3F_7^+(g)+F(g)$	360.200	6.900	68/1
66	$Si_3F_8(g)=Si_3F_8^+(g)$	250.000	6.900	68/1
67	$SiO_2(c1)+6HF(4.0H_2O)$ $=H_2SiF_6(20H_2O)+2H_2O(l)$	−33.290	0.080	51/1
		Residual	−0.113	
		−33.000	0.100	48/1
		Residual	0.177	
68	$Si(cs)+O_2(gs)+6HF(30H_2O)$ $=H_2SiF_6(a1)+2H_2O(l)$	−249.890	0.250	64/2
		Residual	−0.012	
69	$Si(cs)+O_2(gs)+6HF(4.0H_2O)$ $=H_2SiF_6(a2)+2H_2O(l)$	−250.300	0.250	64/2
		Residual	0.015	

	Reaction	ΔH° (kcal/mol)	Error	Ref
70	$H_2SiF_6(a3)=H_2SiF_6(a2)$	0.000	0.000	64/4
71	$H_2SiF_6(a1)=H_2SiF_6(a4)$	0.000	0.000	72/1
72	$2Si(cs)+3H_2(gs)+F_2(gs)=2SiH_3F(g)$	−210.000	30.000	71/1
73	$Si(cs)+H_2(gs)+F_2(gs)=H_2SiF_2(g)$	−194.000	15.000	71/1
74	$2Si(cs)+H_2(gs)+3F_2(gs)=2SiHF_3(g)$	−566.000	30.000	71/1
75	$SiCl(g)=Si(g)+Cl(g)$	90.000	15.000	64/8
76	$SiCl_4(c)=SiCl_4(l)$	1.845	0.020	22/1
77	$SiCl_4(l)=SiCl_4(g)$	7.090	0.100	71/1
78	$Si(cs)+2Cl_2(gs)=SiCl_4(l)$	−165.490	0.160	69/1
		Residual	−0.013	
79	$SiCl_4(l)+4Ag(cs)=Si(cs)+4AgCl(c)$	42.700	2.000	64/5
		Residual	−1.297	
80	$SiCl_4(l)+6NaOH(c)=Na_2SiO_3(c)+4NaCl(c)+3H_2O(l)$	−192.310	9.000	61/2
		Residual	−8.862	
81	$SiCl_4(l)+2H_2O(l)=SiO_2(a)+4HCl(100H_2O)$	−79.750	5.000	66/1
		Residual	−6.061	
82	$SiCl_4(l)+2H_2O(l)=SiO_2(a)+4HCl(500H_2O)$	−76.600	5.000	71/1
		Residual	−2.291	
83	$SiCl_4(l)+6HF(4.0H_2O)=H_2SiF_6(a3)+4HCl(10H_2O)$	−98.610	5.000	64/4
		Residual	3.745	
84	$SiCl_4(g)+Si(cs)=2SiCl_2(g)$	78.350	0.500	71/1
		Residual	−0.210	
		78.490	0.500	71/1
		Residual	−0.070	
		78.840	0.500	71/1
		Residual	0.280	
85	$SiCl_4(g)=SiCl_3^+(g)+Cl(g)$	287.800	9.000	62/2
		Residual	−3.475	
86	$SiCl_3H(g)=SiCl_3^+(g)+H(g)$	274.700	9.000	62/2
		Residual	3.475	
87	$3H_2(gs)+Cl_2(gs)+2Si(cs)=2SiH_3Cl(g)$	−96.000	30.000	71/1
88	$H_2(gs)+Cl_2(gs)+Si(cs)=SiH_2Cl_2(g)$	−80.000	15.000	71/1
89	$SiCl_3H(g)+5NaOH(c)=Na_2SiO_3(c)+3NaCl(c)+2H_2O(l)+H_2(gs)$	−169.150	0.300	61/2
		Residual	−0.003	
90	$SiCl_3H(l)=SiCl_3H(g)$	6.500	0.100	61/2
91	$Cl_2(gs)+3F_2(gs)+2Si(cs)=2ClSiF_3(g)$	−630.000	30.000	71/1
92	$3Cl_2(gs)+F_2(gs)+2Si(cs)=2FSiCl_3(g)$	−402.000	30.000	71/1
93	$2Si(cs)+Br_2(ls)=2SiBr(g)$	100.000	2.000	NBS
94	$SiBr_4(l)=SiBr_4(g)$	10.380	0.200	47/1
95	$SiBr_4(l)+4Ag(cs)=Si(cs)+4AgBr(c)$	13.300	1.560	64/5
		Residual	3.416	
96	$SiBr_4(l)+6NaOH(c)=Na_2SiO_3(c)+4NaBr(c)+3H_2O(l)$	−199.200	2.000	62/4
		Residual	−4.919	
97	$Si(cs)+SiBr_4(g)=2SiBr_2(g)$	71.500	1.000	67/4
		Residual	−1.680	
		79.900	2.000	66/3
		Residual	6.720	
98	$SiHBr_3(l)=SiHBr_3(g)$	9.000	1.000	62/4
99	$SiHBr_3(l)+5NaOH(c)=Na_2SiO_3(c)+3NaBr(c)+2H_2O(l)+H_2(gs)$	−171.600	2.000	62/4
100	$SiI_4(c)=SiI_4(l)$ Estimated value	3.000	2.000	
101	$SiI_4(l)=SiI_4(g)$ Estimated value	16.900	2.000	
102	$SiI_4(l)+4Ag(cs)=Si(cs)+4AgI(c)$	−13.800	0.850	64/5
103	$SiI_4(g)=SiI_2(g)+2I(g)$	98.800	1.000	67/4
104	$Si(cs)+S(cs)=SiS(g)$	16.926	0.100	71/1
105	$SiS_2(c)=SiS_2(l)$	5.000	1.000	71/1
106	$SiS_2(c)+6HF(4.0H_2O)=H_2SiF_6(20H_2O)+2H_2S(g)$	−72.800	2.200	54/1

	Reaction	ΔH° (kcal/mol)	Error	Ref
107	$Si(cs)+Se(cs)=SiSe(g)$	23.780	0.100	NBS
108	$Si(cs)+2Se(cs)=SiSe_2(c)$	−7.000	1.000	NBS
109	$2Si(cs)+Te_2(g)=2SiTe(g)$	61.600	6.000	67/1
		Residual	−1.620	
		63.400	2.000	67/1
		Residual	0.180	
110	$Si(cs)+Te_2(g)=SiTe_2(g)$	13.100	4.000	67/1
111	$2Si_2Te_3(c)=4Si(cs)+3Te_2(g)$	160.600	8.000	67/1
		Residual	0.500	
		159.600	8.000	67/1
		Residual	−0.500	
112	$SiN(g)=Si(g)+N(g)$	130.000	15.000	71/1
113	$2Si_2N(g)=4Si(g)+N_2(gs)$	247.000	2.000	67/2
114	$Si_3N_4(c)=3Si(cs)+2N_2(gs)$	177.600	1.000	71/1
		Residual	−0.006	
115	$Si_3N_4(c)=3Si(l)+2N_2(gs)$	213.000	7.000	71/1
		Residual	0.637	
116	$N_2(gs)+4H_2(gs)+Si(cs)+3F_2(gs)=(NH_4)_2SiF_6(c1)$	−640.940	0.100	NBS
117	$(NH_4)_2SiF_6(c1)=(NH_4)_2SiF_6(c2)$	0.270	0.100	NBS
118	$(NH_4)_2SiF_6(a)=2NH_4^+(a)+SiF_6^{--}(a)$	0.000	0.000	
119	$(NH_4)_2SiF_6(550H_2O)=(NH_4)_2SiF_6(a)$	−0.695	0.001	NBS
120	$(NH_4)_2SiF_6(800H_2O)=(NH_4)_2SiF_6(a)$	−0.835	0.001	NBS
121	$(NH_4)_2SiF_6(1500H_2O)=(NH_4)_2SiF_6(a)$	−1.100	0.001	NBS
122	$SiC(c1)+4F_2(gs)=SiF_4(g)+CF_4(g)$	−591.790	0.380	70/1
		Residual	−0.032	
123	$SiC(c1)=C(cs)+Si(g)$	125.000	3.000	58/2
		Residual	−0.190	
124	$SiC(c2)+4F_2(gs)=SiF_4(g)+CF_4(g)$	−591.530	0.340	70/1
		Residual	−0.006	
125	$SiC(c2)=C(cs)+Si(g)$	126.000	3.000	61/3
		Residual	0.575	
126	$C(cs)+Si(g)=SiC(g)$	65.940	4.000	71/1
		Residual	1.635	
		62.670	4.000	71/1
		Residual	−1.635	
127	$2C(cs)+Si(g)=SiC_2(g)$	39.000	4.000	71/1
		Residual	−0.297	
		38.300	4.000	71/1
		Residual	−0.997	
128	$2SiC(c1)=Si(l)+SiC_2(g)$	194.800	4.000	71/1
		Residual	1.457	
129	$C(cs)+2Si(g)=Si_2C(g)$	−88.000	4.000	71/1
		Residual	−0.685	
		−86.800	4.000	71/1
		Residual	0.515	
130	$SiC(c1)+Si(l)=Si_2C(g)$	134.400	4.000	71/1
		Residual	0.191	
131	$(CH_3)_4Si(l1)+8O_2(gs)+6HF(80H_2O)=H_2SiF_6(a4)+4CO_2(g)+8H_2O(l)$	−971.400	2.400	72/1
		Residual	1.689	
132	$(C_2H_5)_2SiH_2(l2)+8O_2(gs)+6HF(80H_2O)=H_2SiF_6(a4)+4CO_2(g)+8H_2O(l)$	−985.500	3.200	72/1
133	$(C_2H_5)_3SiH(l1)+11O_2(gs)+6HF(80H_2O)=H_2SiF_6(a4)+6CO_2(g)+10H_2O(l)$	−1304.300	3.700	72/1
134	$(C_2H_5)_4Si(l)+14O_2(gs)+6HF(80H_2O)=H_2SiF_6(a4)+8CO_2(g)+12H_2O(l)$	−1612.700	3.500	72/1
135	$2(CH_3)_6Si_2(l)+25O_2(gs)+24HF(80H_2O)=4H_2SiF_6(a4)+12CO_2(g)+26H_2O(l)$	−3167.600	3.600	72/1
		Residual	0.052	
136	$(CH_3)_8Si_3(l)+17O_2(gs)+18HF(80H_2O)=3H_2SiF_6(a4)+8CO_2(g)+18H_2O(l)$	−2199.500	3.900	72/1
		Residual	−1.693	

	Reaction	ΔH° (kcal/mol)	Error	Ref
137	$2(CH_3)_{10}Si_4(l)+43O_2(gs)+48HF(80H_2O)$ $=8H_2SiF_6(a4)+20CO_2(g)+46H_2O(l)$	−5635.400	10.600	72/1
		Residual	0.629	
138	$(CH_3)_{12}Si_5(c)+26O_2(gs)+30HF(80H_2O)$ $=5H_2SiF_6(a4)+12CO_2(g)+28H_2O(l)$	−3455.600	7.400	72/1
139	$(CH_3)_2Si(CH_2)_3(l)+9O_2(gs)+6HF(80H_2O)$ $=H_2SiF_6(a4)+5CO_2(g)+8H_2O(l)$	−1089.000	2.600	72/1
140	$2(CH_3)_2Si(CH_2)_4(l)+21O_2(gs)+12HF(80H_2O)$ $=2H_2SiF_6(a4)+12CO_2(g)+18H_2O(l)$	−2480.600	3.000	72/1
141	$Si_2C_6H_{16}(l)+12O_2(gs)+12HF(80H_2O)$ $=2H_2SiF_6(a4)+6CO_2(g)+12H_2O(l)$	−1529.400	3.000	72/1
142	$CH_3SiH_3(l)=CH_3SiH_3(g)$	4.390	0.100	53/1
143	$(CH_3)_2SiH_2(l)=(CH_3)_2SiH_2(g)$	5.100	0.100	53/1
144	$(CH_3)_3SiH(l)=(CH_3)_3SiH(g)$	5.820	0.100	53/1
145	$(CH_3)_4Si(l1)=(CH_3)_4Si(g1)$	6.250	0.100	53/1
		Residual	−0.003	
146	$(C_2H_5)_2SiH_2(l2)=(C_2H_5)_2SiH_2(g2)$	7.180	0.100	53/1
147	$(CH_3)_3SiC_2H_5(l)=(CH_3)_3SiC_2H_5(g)$	7.200	0.200	46/1
148	$(C_2H_5)_3SiH(l1)=(C_2H_5)_3SiH(g1)$	8.700	0.300	72/1
149	$(C_2H_5)_4Si(l)=(C_2H_5)_4Si(g)$	9.500	0.500	46/1
150	$(CH_3)_6Si_2(l)=(CH_3)_6Si_2(g)$	8.940	0.100	59/1
151	$(CH_3)_8Si_3(l)=(CH_3)_8Si_3(g)$	11.000	0.200	72/3
		Residual	0.003	
152	$(CH_3)_{10}Si_4(l)=(CH_3)_{10}Si_4(g)$	12.500	0.400	72/3
		Residual	−0.002	
153	$(CH_3)_{12}Si_5(c)=(CH_3)_{12}Si_5(g)$	20.000	5.000	72/3
154	$(CH_3)_2Si(CH_2)_3(l)=(CH_3)_2Si(CH_2)_3(g)$	8.300	0.500	72/1
155	$(CH_3)_2Si(CH_2)_4(l)=(CH_3)_2Si(CH_2)_4(g)$	9.000	0.500	72/1
156	$Si_2C_6H_{16}(l)=Si_2C_6H_{16}(g)$	9.800	0.500	72/1
157	$(CH_3)_3SiH(g)=(CH_3)_3Si(g)+H(g)$	80.200	0.500	71/3
		Residual	−0.012	
158	$(CH_3)_3SiH(g)=(CH_3)_2SiH(g)+CH_3(g)$	76.500	0.500	71/3
159	$(CH_3)_6Si_2(g)=2(CH_3)_3Si(g)$	67.000	2.000	68/3
		Residual	−0.188	
160	$CH_3SiH_3(g)=CH_3SiH_2^+(g)+H(g)$	272.100	9.000	70/5
161	$(CH_3)_2SiH_2(g)=(CH_3)_2SiH^+(g)+H(g)$	256.400	9.000	70/5
162	$(CH_3)_2SiH_2(g)=CH_3SiH_2^+(g)+CH_3(g)$	265.400	9.000	70/5
163	$(CH_3)_3SiH(g)=(CH_3)_3Si^+(g)+H(g)$	242.600	9.000	70/5
		Residual	−1.312	
		247.200	9.000	66/5
		Residual	3.288	
		244.400	9.000	67/5
		Residual	0.488	
		246.100	9.000	72/2
		Residual	2.188	
164	$(CH_3)_3SiH(g)=(CH_3)_2SiH^+(g)+CH_3(g)$	251.600	9.000	70/5
		Residual	−3.350	
		258.300	9.000	68/2
		Residual	3.350	
165	$(CH_3)_4Si(g1)=(CH_3)_3Si^+(g)+CH_3(g)$	236.400	9.000	70/5
		Residual	−7.659	
		242.800	9.000	66/5
		Residual	−1.259	
		239.800	9.000	67/5
		Residual	−4.259	
		242.800	9.000	69/4
		Residual	−1.259	
166	$(CH_3)_3SiC_2H_5(g)=(CH_3)_3Si^+(g)+C_2H_5(g)$	238.500	9.000	66/5
167	$(CH_3)_6Si_2(g)=(CH_3)_3Si^+(g)+(CH_3)_3Si(g)$	231.300	9.000	66/5
		Residual	0.412	
		230.600	9.000	67/5
		Residual	−0.288	

	Reaction	ΔH° (kcal/mol)	Error	Ref
		232.900	9.000	67/6
		Residual	2.012	
		235.700	9.000	69/4
		Residual	4.812	
168	$(CH_3)_6Si_2(g)=(CH_3)_5Si_2^+(g)+CH_3(g)$	237.100	9.000	72/3
		Residual	−2.673	
169	$(CH_3)_8Si_3(g)=(CH_3)_3Si^+(g)+(CH_3)_5Si_2(g)$	246.800	9.000	72/3
		Residual	2.388	
		247.700	9.000	72/2
		Residual	3.288	
170	$(CH_3)_8Si_3(g)=(CH_3)_5Si_2^+(g)+(CH_3)_3Si(g)$	229.500	9.000	72/3
		Residual	5.512	
171	$(CH_3)_8Si_3(g)=(CH_3)_7Si_3^+(g)+CH_3(g)$	238.500	9.000	72/3
		Residual	−1.579	
172	$(CH_3)_{10}Si_4(g)=(CH_3)_3Si^+(g)+(CH_3)_7Si_3(g)$	259.400	9.000	72/3
173	$(CH_3)_{10}Si_4(g)=(CH_3)_5Si_2^+(g)+(CH_3)_5Si_2(g)$	229.000	9.000	72/3
		Residual	−2.838	
174	$(CH_3)_{10}Si_4(g)=(CH_3)_7Si_3^+(g)+(CH_3)_3Si(g)$	220.200	9.000	72/3
		Residual	1.579	
175	$(CH_3)_{12}Si_5(g)=(CH_3)_3Si^+(g)+(CH_3)_9Si_4(g)$	262.200	9.000	72/3
176	$CH_3SiCl_3(l)+3H_2O(l)=CH_3Si(OH)_3(a)+3HCl(a)$	−51.500	0.500	53/3
177	$2C(cs)+Si(cs)+4H_2(gs)+O_2(gs)=(CH_3)_2Si(OH)_2(a)$	−205.000	5.000	66/1
		Residual	1.238	
178	$2(CH_3)_3SiOH(l)=(CH_3)_6Si_2O(l)+H_2O(l)$	−2.400	0.200	67/7
179	$(CH_3)_3SiOH(l)=(CH_3)_3SiOH(g)$	10.900	0.400	53/2
180	$2(CH_3)_3SiOC_2H_5(l)+H_2O(l)=(CH_3)_6Si_2O(l)+2C_2H_5OH(50H_2O)$	−11.400	0.200	72/4
181	$12C(cs)+Si(cs)+6H_2(gs)+O_2(gs)=(C_6H_5)_2Si(OH)_2(a)$	−155.000	5.000	66/1
182	$(CH_3)_6Si_2O(l)+12O_2(gs)+12HF(80H_2O)=2H_2SiF_6(a4)+6CO_2(g)+13H_2O(l)$	−1484.800	4.200	72/1
		Residual	−0.699	
183	$(CH_3)_6Si_2O(l)+12O_2(gs)+12HF(25H_2O)=2H_2SiF_6(a1)+6CO_2(g)+13H_2O(l)$	−1484.510	1.490	64/2
		Residual	−0.037	
184	$(CH_3)_6Si_2O(l)+12O_2(gs)+12HF(4.0H_2O)=2H_2SiF_6(a2)+6CO_2(g)+13H_2O(l)$	−1485.460	1.620	64/2
		Residual	−0.186	
185	$(CH_3)_8Si_3O_2(l)+16O_2(gs)+18HF(80H_2O)=3H_2SiF_6(a4)+8CO_2(g)+18H_2O(l)$	−1983.300	2.400	72/1
186	$(CH_3)_{10}Si_4O_3(l)+20O_2(gs)+24HF(80H_2O)=4H_2SiF_6(a4)+10CO_2(g)+23H_2O(l)$	−2492.200	5.000	72/1
187	$2(CH_3)_{12}Si_5O_4(l)+48O_2(gs)+60HF(80H_2O)=10H_2SiF_6(a4)+24CO_2(g)+56H_2O(l)$	−5965.800	14.600	72/1
188	$(CH_3)_6Si_2O(l)=(CH_3)_6Si_2O(g)$	8.900	0.400	47/1
189	$(CH_3)_8Si_3O_2(l)=(CH_3)_8Si_3O_2(g)$	9.500	0.500	72/1
190	$(CH_3)_{10}Si_4O_3(l)=(CH_3)_{10}Si_4O_3(g)$	11.500	0.500	72/1
191	$(CH_3)_{12}Si_5O_4(l)=(CH_3)_{12}Si_5O_4(g)$	12.700	0.500	72/1
192	$(CH_3)_3SiCl(l)+6O_2(gs)=SiO_2(a)+3CO_2(g)+4H_2O(l)+HCl(600H_2O)$	−720.900	5.000	70/6
		Residual	−0.186	
193	$CH_3SiCl_3(l)+2O_2(gs)=SiO_2(a)+CO_2(g)+3HCl(600H_2O)$	−283.800	5.000	70/6
		Residual	8.198	
194	$(CH_3)_2SiCl_2(l)+4O_2(gs)=SiO_2(a)+2CO_2(g)+2H_2O(l)+2HCl(600H_2O)$	−503.400	5.000	68/4
		Residual	1.135	
195	$2(CH_3)_2HSiCl(l)+9O_2(gs)=2SiO_2(a)+4CO_2(g)+6H_2O(l)+2HCl(600H_2O)$	−1141.000	5.000	68/4
196	$2CH_3HSiCl_2(l)+5O_2(gs)=2SiO_2(a)+2CO_2(g)+2H_2O(l)+4HCl(600H_2O)$	−707.200	5.000	68/4

	Reaction	ΔH° (kcal/mol)	Error	Ref
197	$(CH_3)_2SiCl_2(l)+2H_2O(l)$			
	$=(CH_3)_2Si(OH)_2(a)+2HCl(500H_2O)$	−32.090	0.200	66/1
		Residual	0.055	
		−32.500	0.500	53/3
		Residual	−0.355	
198	$(C_6H_5)_2SiCl_2(l)+2H_2O(l)$			
	$=(C_6H_5)_2Si(OH)_2(a)+2HCl(500H_2O)$	−31.640	0.500	66/1
199	$(CH_3)_3SiCl(l)=(CH_3)_3SiCl(g)$	7.210	0.200	60/1
		Residual	0.007	
200	$(CH_3)_2SiCl_2(l)=(CH_3)_2SiCl_2(g)$	7.540	0.200	60/1
		Residual	0.002	
201	$CH_3SiCl_3(l)=CH_3SiCl_3(g)$	7.500	0.200	60/1
		Residual	−0.003	
202	$2(CH_3)_3SiCl(g)=(CH_3)_2SiCl_2(g)+(CH_3)_4Si(g1)$	3.600	2.000	48/2
		Residual	0.503	
203	$2(CH_3)_2SiCl_2(g)=CH_3SiCl_3(g)+(CH_3)_3SiCl(g)$	3.600	2.000	48/2
		Residual	0.328	
204	$2(CH_3)_3SiCl(l)+H_2O(l)$			
	$=(CH_3)_6Si_2O(l)+2HCl(50H_2O)$	−21.600	0.200	67/7
		Residual	0.091	
205	$2(CH_3)_3SiCl(l)+H_2O(l)$			
	$=(CH_3)_6Si_2O(l)+2HCl(800H_2O)$	−22.360	0.120	66/6
		Residual	−0.033	
206	$(CH_3)_3SiCl(l)+2(C_2H_5)_2NH(l)$			
	$=(CH_3)_3SiN(C_2H_5)_2(l)+(C_2H_5)_2NH_2Cl(c)$	−32.100	0.300	62/6
207	$(CH_3)_3SiCl(g)=(CH_3)_2SiCl^+(g)+CH_3(g)$	244.400	9.000	68/2
208	$2(CH_3)_3SiBr(l)+H_2O(l)$			
	$=(CH_3)_6Si_2O(l)+2HBr(50H_2O)$	−27.400	0.200	67/7
209	$(CH_3)_3SiBr(l)=(CH_3)_3SiBr(g)$	7.800	0.200	67/7
210	$(CH_3)_3SiBr(g)=(CH_3)_2SiBr^+(g)+CH_3(g)$	246.800	9.000	68/2
211	$(CH_3)_3SiI(g)=(CH_3)_3Si^+(g)+I(g)$	232.900	9.000	67/5
		Residual	3.550	
		225.800	9.000	72/2
		Residual	−3.550	
212	$(CH_3)_3SiI(g)=(CH_3)_2SiI^+(g)+CH_3(g)$	237.500	9.000	68/2
213	$2(CH_3)_3SiSC_4H_9(l)+H_2O(l)$			
	$=(CH_3)_6Si_2O(l)+2C_4H_9SH(l)$	−3.600	0.200	67/7
214	$(CH_3)_3SiSC_4H_9(l)=(CH_3)_3SiSC_4H_9(g)$	9.700	0.100	67/7
215	$2SiC(c1)+N_2(gs)=2SiCN(g)$	221.000	8.000	70/4
		Residual	5.296	
216	$2Si(g)+N_2(gs)+2C(cs)=2SiCN(g)$	−36.000	4.000	70/4
		Residual	−1.324	
217	$2(CH_3)_3SiNHCH_3(l)+H_2O(l)+2HCl(50H_2O)$			
	$=(CH_3)_6Si_2O(l)+2CH_3NH_3Cl(50H_2O)$	−58.600	0.200	67/7
218	$2(CH_3)_3SiN(CH_3)_2(l)+H_2O(l)+2HCl(50H_2O)$			
	$=(CH_3)_6Si_2O(l)+2(CH_3)_2NH_2Cl(50H_2O)$	−50.600	0.200	67/7
219	$(CH_3)_6Si_2NH(l)+H_2O(l)+HCl(50H_2O)$			
	$=(CH_3)_6Si_2O(l)+NH_4Cl(50H_2O)$	−34.500	0.200	67/7
		Residual	0.253	
220	$(CH_3)_6Si_2NH(l)+H_2O(l)+HCl(1500H_2O)$			
	$=(CH_3)_6Si_2O(l)+NH_4Cl(1500H_2O)$	−34.490	0.040	66/6
		Residual	−0.010	
221	$(CH_3)_6Si_2NCH_3(l)+H_2O(l)+HCl(50H_2O)$			
	$=(CH_3)_6Si_2O(l)+CH_3NH_3Cl(50H_2O)$	−38.900	0.200	67/7
222	$2(CH_3)_9Si_3N(c)+3H_2O(l)+2HCl(50H_2O)$			
	$=3(CH_3)_6Si_2O(l)+2NH_4Cl(50H_2O)$	−98.200	1.000	67/7
223	$(CH_3)_3SiNHCH_3(l)=(CH_3)_3SiNHCH_3(g)$	8.600	0.100	67/7
224	$(CH_3)_3SiN(CH_3)_2(l)=(CH_3)_3SiN(CH_3)_2(g)$	7.600	0.100	67/7
225	$(CH_3)_6Si_2NH(l)=(CH_3)_6Si_2NH(g)$	9.900	0.100	67/7
226	$(CH_3)_6Si_2NCH_3(l)=(CH_3)_6Si_2NCH_3(g)$	9.300	0.100	67/7
227	$(CH_3)_9Si_3N(c)=(CH_3)_9Si_3N(g)$	13.000	0.100	67/7

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